

## Systematic Studies of Asian *Aconitum* (Ranunculaceae) VII. A New Species and a New Form of Subgenus *Lycoctonum* from Hokkaido, Japan

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A new species and a new form of the genus *Aconitum* subgenus *Lycoctonum* are described from Hokkaido, Japan. *Aconitum mashikense*, an endemic of the Mashike and the Kabato Mountains, central Hokkaido, is characterized by pedicels golden villose with rough-surfaced patent hairs and linear bracteoles situated near the base of the pedicels. *Aconitum gigas* f. *bicolor* characterized by two-tone sepals is reported from southern Hokkaido.  
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**Key words:** *Aconitum*, Hokkaido, Japan, subgenus *Lycoctonum*, new taxa

Contributing to the Flora of Japan, new English edition, in 1997 I reexamined a mass collection of “*Aconitum gigas* H.Lév. & Vaniot” which was made by myself at Mt. Shokanbetsudake, the Mashike Mountain Range, central Hokkaido, Japan. *Aconitum gigas* is characterized by pedicels strigose with rough-surfaced curved hairs, however, it was revealed that most plants of this mass collection had pedicels which were clothed with a mixture of rough-surfaced curved hairs and rough-surfaced patent hairs. This type of intermediate pedicel indumentum suggested that these plants were putative hybrid derivatives between *A. gigas* and an unknown species with pedicels villose with rough-surfaced patent hairs (e.g., Kadota 1987, 1991). Such plants were not reported from Japan (Tamura 1974, 1982). Since then I had made field and herbarium examinations repeatedly to find such plants, however, I had been unsuccessful.

In 1999 I asked Mr. Shun Umezawa (Sapporo, Hokkaido) to try to find the plants in question. He made extensive field survey throughout Hokkaido in 2000 and found out the plants in the Mashike and the Kabato Mountains. These plants are clearly recognized to belong a new species. The new species will be described here as *Aconitum mashikense*. A new two-tone form of *A. gigas* will be also described here.

***Aconitum mashikense* Kadota & Umezawa, sp. nov.** [Figs. 1, left, 2, 3]

Haec species ab *Aconito gigante* pedicellis villosis et bracteolis linearis dispositis prope basibus pedicellorum differt.

An erect, subscapose perennial, up to 1.5 m tall. Root 2–3 cm in diameter at the ground surface level, branched, rhizomatic. Stem robust, branched in the upper part, almost glabrous but sparingly pilose with flexuous hairs in the distal part. Basal leaves



Fig. 1. *Aconitum mashikense* Kadota & Umezawa (left) and *A. gigas* f. *bicolor* (right). Left. Hokkaido, Ishikari-gun, Tōbetsu-machi, Mt. Kamuishiriyama (8 June 2000). Right. Hokkaido, Shiribeshi-shicho, Iwanai-gun, Rankoshi-machi, Lake Kokkuri-ko, alt. 565 m (17 June 1994). Photos by S. Umezawa.

sometimes persistent at anthesis. Blades of lower cauline leaves membranous, 19–26 cm

wide, 16–24 cm long, roundish reniform to roundish in outline, medially 7–11 (–13)



Fig. 2. *Aconitum mashikense* Kadota & Umezawa (Hokkaido, Ishikari-shicho, Hamamasu-gun, Hamamasu-mura, Mt. Koganeyama alt. 380 m, 17 June 2000, S. Umezawa 20104, TNS, holotype).

lobed to 2–4 cm from the base, sericeous with adpressed hairs along veins on the abaxial side; middle lobes obovato-rhombic, obtuse, 9–14 cm wide, 7–11 cm long, finely serrate; laciniae narrowly ovate to lanceolate, acuminate, 3–8 mm wide; bases deeply cordate; petioles up to 30 cm long, hollow, sparingly pilose with flexuous hairs. Inflorescence in indeterminate condition, racemose, 12–40 cm long, ca. 20-flowered, bracteate; bracts foliaceous and deeply trilobed to linear, diminishing in size to the proximal part. Pedicels arching inwardly, 2–4.5 cm long, densely golden villose with rough-surfaced patent hairs, devoid of glandular hairs, bi-bracteolate; bracteoles linear, 1–2 mm long, situated near the base of the pedicels. Flowers dull yellow, golden villose with rough-surfaced patent hairs; helmets cylindrical with obliquely and downward projecting short beaks and sometimes with recurved apical parts, 13–20 mm wide, 17–30 mm long, 14–20 mm high; lateral sepals roundish, ca. 10 mm in diameter, golden villose with rough-surfaced, straight and ascending, long hairs (pollen-collecting hairs) at the proximal part on the adaxial side; lower sepals elliptic, obtuse, 4–6 mm wide, 10–12 mm long. Nectaries glabrous, cream-colored; blades tubular, 2–3 mm long, ca. 2 mm in diameter; labia ca. 2 mm long, shorter than the blades, slightly emarginate, not reflexed; stalks erect, 10–12 mm long; spurs 4–6 mm long, incurved to 270 degrees. Stamens glabrous, provided with staminal teeth. Carpels 3 (–4), glabrous. Follicles 15–18 mm long, erect or slightly divergent, provided with fine styles; seeds trigonous, ca. 2 mm long, lamellate transversely, not alate.

TYPE: JAPAN; Hokkaido, Ishikari-shicho, Hamamasu-gun, Hamamasu-mura, Mt. Koganeyama alt. 380 m, 17 June 2000, S. Umezawa 20104 (TNS–holotype, Fig. 2); Ishikari-gun, Tôbetsu-machi, Mt. Kamuishiriyama alt. 380 m, 8 June 2000, S. Umezawa 20107 (TNS–paratype).

Japanese name: Mashike-reijinsô (nov.).

Other specimens examined: JAPAN; Hokkaido, Ishikari-shicho, Hamamasu-gun, Hamamasu-mura, Goryochi alt. 80 m, 17 June 2000, S. Umezawa 20101, 20108–20111 (TNS); Hamamasu-mura, Mt. Koganeyama alt. 380 m, 17 June 2000, S. Umezawa 20104–20106, 20112–20113 (TNS); Mt. Koganeyama alt. 470 m, 17 June 2000, S. Umezawa 20102, 20103, 20114–20115 (TNS). Sorachi-shicho, Shintotsukawa-machi, Mt. Pin'neshiri alt. 380 m, 8 July 2000, S. Umezawa 20119 (TNS); Mt. Pin'neshiri alt. 950 m, 8 July 2000, S. Umezawa 20116–20118 (TNS). Uryu-gun, Uryu-machi, Mt. Shokanbetsudake, Uryu-numa Moor alt. 660 m, 21 August 2000, S. Umezawa 20122–20125 (TNS). Rumoi-shicho, Mashike-gun, Mashike-machi, Mt. Shokanbetsudake, Hashibetsu course alt. 650 m, 6 August 2000, S. Umezawa 20120 (TNS); Mt. Shokanbetsudake, Hashibetsu course alt. 720 m, 6 August 2000, S. Umezawa 20121 (TNS).

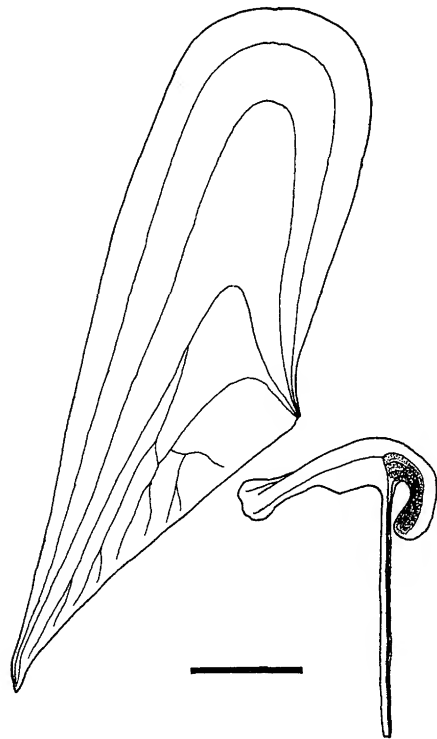


Fig. 3. Helmet and nectary of *Aconitum mashikense* Kadota & Umezawa (voucher: JAPAN: Hokkaido, Ishikari-shicho, Ishikari-gun, Tôbetsu-machi, Mt. Kamuishiriyama, S. Umezawa 20107, TNS, paratype). Scale indicates 5 mm

*Aconitum mashikense* resembles *A. gigas* in flower color and the shape of helmets and nectaries, however, the former is discriminated from the latter in the pedicel pubescence (golden villose with rough-surfaced patent hairs [Fig. 4] vs. strigose with rough-surfaced curved hairs) and the position of bracteoles on pedicels (near the base of pedicels vs. around the middle of pedicels). *Aconitum puchonroenicum* Uyeki & Sakata [in Acta Phytotax. Geobot. 7: 14, 1938] from northern Korea and southern Primorye (Russia) is also similar to *A. mashikense* in the flower color and the indumentum of pedicels. However, *A. puchonroenicum* is clearly distinguished from *A. mashikense* in the helmet shape (tall conical with tapering proximal parts vs. cylindrical). The two species are also different in the pedicel pubescence. Pedicels of *A. puchonroenicum* are white villose with smooth-surfaced patent hairs and additionally a small amount of smooth-surfaced glandular hairs. While those of *A. mashikense* are golden villose with only rough-surfaced patent hairs (Fig. 4). Among East Asian villose-pedicellate species pedicels are usually covered with a

mixture of smooth-surfaced patent hairs and smooth-surfaced glandular hairs (e.g., *A. loczyanum* Rapaics in the subgenus *Lycotconum* and *A. senanense* Nakai in the subgenus *Aconitum*; cf., Kadota 1981, 1987). In the Great Himalayan villose-pedicellate species there is additionally a group whose pedicels are golden villose with rough-surfaced patent hairs (e.g., *A. novoluridum* Munz in the subgenus *Lycotconum* and *A. forrestii* Stapf in the subgenus *Aconitum*). In East Asia *A. mashikense* is thus the only representative of the golden villose-pedicellate species whose pedicels are covered with rough-surfaced patent hairs only.

*Aconitum mashikense* is endemic to the Mashike and the Kabato Mountains, central Hokkaido (Fig. 5). On the contrary *A. gigas* is distributed throughout Hokkaido and the range is also extending to central Honshu southward and to Sakhalin northward (Kadota unpubl.).

*Aconitum gigas* H.Lév. & Vaniot in Bull. Soc. Bot. Fr. 53: 389 (1906).

forma **bicolor** Kadota & Umezawa, f. nov.

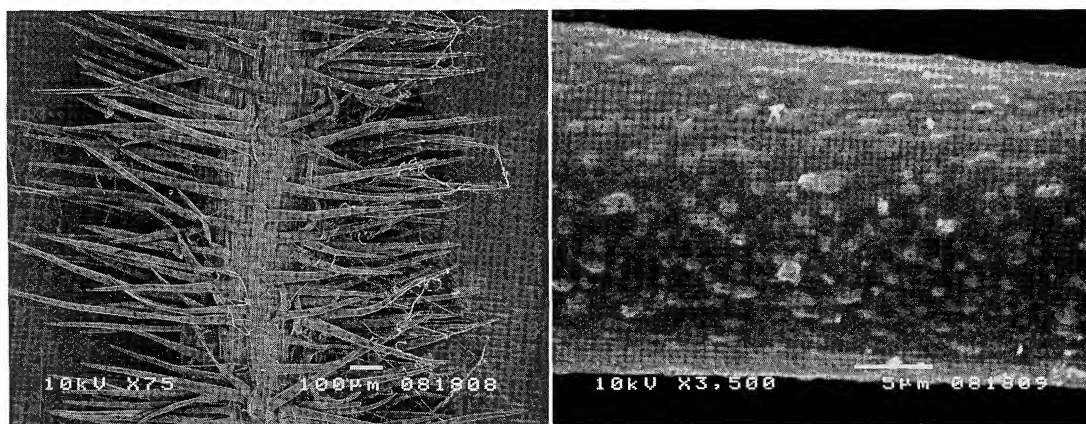


Fig. 4. Pedicel indumentum (left) and a rough-surfaced patent hair (right) of *Aconitum mashikense* Kadota & Umezawa (voucher: JAPAN: Hokkaido, Ishikari-shicho, Hamamasu-gun, Hamamasu-mura, Mt. Koganeiyama, S. Umezawa 20102, TNS).



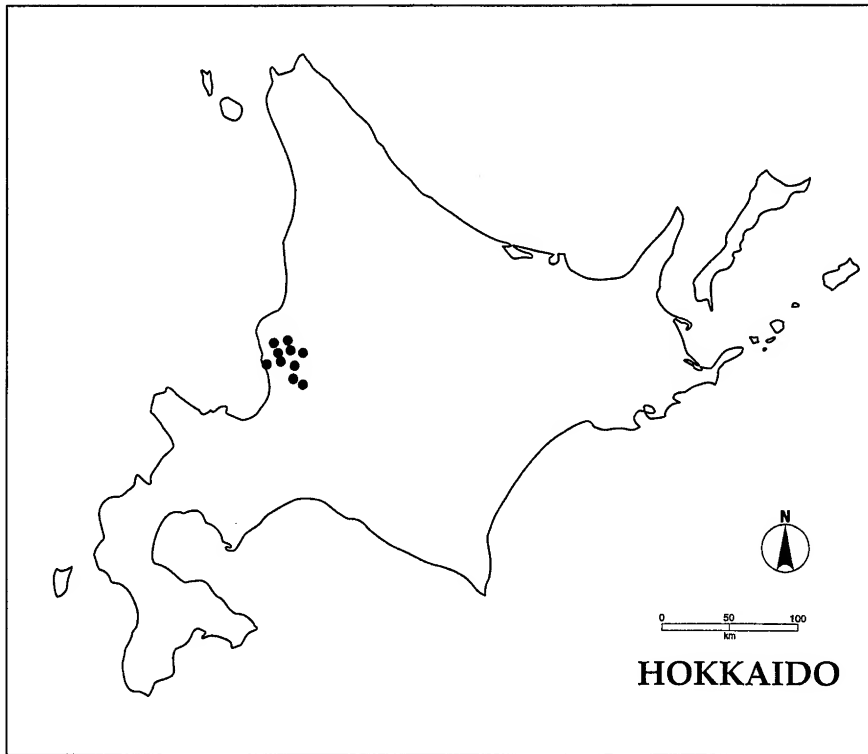


Fig. 5. Distribution of *Aconitum mashikense* Kadota & Umezawa.

[Figs. 1, right, 6]

A typo sepalis bicoloribus differt.

TYPE: JAPAN; Hokkaido, Shiribeshi-shicho, Iwanai-gun, Rankoshi-machi, Lake Kokkuri-ko, 7 June 1994, S. Umezawa s.n. (TNS 676576–holotype).

Japanese name: Hagoromo-reijinsô (nov.).

Flowers of *A. gigas* f. *bicolor* are pale pink except for their anterior parts of sepals which are dark purple. *Aconitum* species belonging to Ser. *Lycotonia* Tamura & Lauener bear dull yellow, rosy, dull purple, purplish blue to pale pink and they are divided into two groups: a group with yellowish flowers and another with non-yellowish flowers. *Aconitum gigas* is common throughout Hokkaido, Japan and this species bears constantly dull yellowish flowers. It is therefore noteworthy that *A. gigas* f. *bicolor* has two-tone flowers.

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Fig. 6. *Aconitum gigas* H.Lév. & Vaniot f. *bicolor* Kadota & Umezawa (Hokkaido, Shiribeshi-shicho, Iwanai-gun, Rankoshi-machi, Lake Kakkuri-ko, 7 June 1994, S. Umezawa s.n., TNS, holotype).

門田裕一：アジア産トリカブト属（キンポウゲ科）  
の分類学的研究 VII. 北海道産レイジンソウ亜属  
の1新種と1新品種

北海道産のレイジンソウ亜属の1新種と1新品種を記載した。マシケレイジンソウ *Aconitum mashikense* Kadota & Umezawa は北海道中央部日本海側に位置する増毛山地と樺戸山系の固有種である。マシケレイジンソウはオオレイジンソウに似ているが、花梗に粗面開出毛がはえ、小苞が花梗の基部近くに着くことで区別される。北朝鮮からロシア沿海地方南部にかけて分布するフセンキエボシソウ *A. puchonroenicum* Uyeki & Sakata は黄色い花を咲かせ、花梗に開出毛があるので一見マシケレイジンソウに似ている。しかし、この両者は上萼片の形において明瞭に異なっている。すなわち、マシケレイジンソウでは円筒形であるのに対して、フセンキエボシソウでは背の高い円錐形で頂部が次第に細くなる。またフセンキエボシソウの花梗にはえる開出毛は滑面開出毛であり、

マシケレイジンソウの粗面開出毛とは異なる。さらに、フセンキエボシソウの花梗には多少とも滑面の腺毛が混在する。東アジアでは、一般に、花梗に開出毛がはえる種は滑面開出毛と滑面腺毛の双方をもつ。一方、大ヒマラヤ地域にはこれに加えて花梗に粗面開出毛のみをもつ一群の種がレイジンソウ亜属にもトリカブト亜属にもある。マシケレイジンソウは花梗に粗面開出毛のみをもつ東アジアにおけるこれまでのところ唯一の種である。

オオレイジンソウの1新品種としてハゴロモレイジンソウ *A. gigas* H.Lév. & Vaniot f. *bicolor* Kadota & Umezawa を記載した。オオレイジンソウは花の色が安定して淡黄色であるが、これは花全体が淡いピンクで、上萼片の嘴周辺と側萼片と下萼片の先端部が濃い紫色となっていてたいへん美しい。  
(国立科学博物館植物研究部)